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Resistance through rituals: The role of Philippine "native pig" (*Sus scrofa*) in Ifugao feasting and socio-political organization



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ABSTRACT

The Ifugao of the northern Philippines successfully resisted repeated attempts by the Spanish at conquest. Archaeological work by the Ifugao Archaeological Project have shown that the successful resistance was predicated on the ability of the Ifugao to consolidate their political and economic resources; where most of the lowland Philippines were placed under Spanish colonial administration within five years of contact, the Ifugao were never conquered militarily. We argue that the observed increase in rituals and feasts in Ifugao was an organizing factor for the successful resistance. This paper provides morphological and quantitative evidence, particularly, in the use of domesticated pigs, which are known ethnographically to be ritual animals. Data presented in this paper support the contention that the shift to wet-rice cultivation was accompanied by other cultural changes that highlighted Ifugao social ranking.

1. Introduction

Successful resistance against a colonizing power involves effective martial organization within a complex polity. Due to violence and diseases, established polities in the Americas and the Philippines were devastated following Spanish conquest. Nevertheless, several groups have been documented to have actively resisted conquest by establishing settlements in remote mountainous settlements (Acabado, 2017; Dillehay, 2007; Palka, 2005, 2009; Peterson, 1991; Schneider, 2015). In the Philippines, scholars have suggested that Spanish conquest of the Magat Valley motivated the Ifugao to strategically resettle in the interior of the Cordillera Mountains between 1600 CE and 1700 CE (Acabado, 2017; Keesing, 1962). Shortly after, they adopted wet-rice agriculture and built extensive rice terraces (Acabado, 2009, 2015, 2017). Before the appearance of wet-rice agriculture, Ifugao communities have cultivated taro, as suggested by starch signatures that appear to be from the corm of taro recovered from sherd charred residue in the Old Kiyyangan Village (Acabado, 2017; Eusebio et al., 2015). The subsistence shift was accompanied by an increase in the consumption of domesticated pigs; a pattern that we argue is associated with increased ritual feasting. The agricultural intensification helped establish a ranked society that awarded political power to individuals skilled in mobilizing the community through prestige feasts. Acabado (2015, 2017) claims that the shift to wet-rice agriculture was spurred by populations from the Magat Valley moving up to the interior of the highlands to avoid Spanish conquest. It is hypothesized that these

This paper provides morphometric evidence for the dramatic increase in pig consumption in the Old Kiyyangan Village, a pre-contact Ifugao settlement that expanded rapidly soon after Spanish contact (Acabado, 2017; Maher, 1984). The expansion of the village and population increase was accompanied by a shift to wet-rice cultivation, upsurge of exotic goods procurement, and increase in the distribution of ritual animals (particularly, domesticated pigs) (Acabado, 2017: 18). Acabado (2017: 22–23) argues that this process indicates political elaboration as a response to Spanish conquest; a process he termed pericolonialism.

We also provide ethnohistoric and ethnographic descriptions of the importance of rituals in Ifugao society. Ethnographic work by Barton (1922b, 1930, 1938) in the early 1900s provides a foundation for the elaborate Ifugao rituals observed today (i.e. Acabado, 2013; Conklin, 1980; Lambrecht, 1962; Remme, 2015; Conklin, 1980). In all of these rituals, pigs appear to be the most important ritual animal.

There are two pig taxa traditionally utilized by the Ifugao, wild (Sus philippensis) and domesticated pig (Sus scrofa). Sus philippensis has a relatively smaller body size than Sus scrofa, and molar dimensions reflect these differences (Piper et al., 2009b: 1). In this paper, we utilize molar dimensions as proxy for body size. Utilizing morphometric measurements of pig dentition from OKV, modern Sus philippensis, and archaeological samples from the Nagbasaran site (Piper et al., 2009b), we have determined that the pig remains from OKV consist of

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lowland populations were already wet-rice producers but the inhabitants of the settlements in the highlands were taro cultivators.

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two pig species, Sus philippensis and Sus scrofa.

Furthermore, we argue that the increase in the density of pigs at OKV coincides with the intensification of feasting activities during the Spanish period. The presence of jar burials, juvenile supine burials, and isolated adult remains at OKV are analogous to Ifugao traditional mortuary practices and feasts (Barton, 1919; Remme, 2015). Barton (1919: 193–194) notes that the Ifugao sacrificed domesticated pigs during funerary rituals that are followed by a feast involving the consumption of the sacrificed animals. Since wild animals are deemed inappropriate for sacrifice during any Ifugao rituals (Remme, 2015), we sampled trenches with the greatest density of human remains. We argue that a large proportion of the pig remains from our sample are domesticated due to the high density of human remains associated with these fauna.

This link between the past and the present provides a tantalizing clue in the development of social ranking in Ifugao. In the Philippines and elsewhere (Abbot and Lack, 2013, 1; 1970, 198; Junker, 1999a, 1999b), local interpolity conflict is linked with the expansion of ritual feasting. As elites attempt to increase their status, they sponsor feasts and rituals to emphasize their differences from non-elites. Lavish feasts would have expanded and/or reinforced alliances with neighboring groups, especially with economies based on prestige and reciprocity. In lowland Philippines, Junker (1994: 251–252) has argued that exotic goods trade initially resulted in interpolity warfare strategies aimed at disrupting foreign trade contacts of competitors. This was followed by the emergence of centralized control of production and distribution of goods valued by both foreign traders and local consumers.

Similarly, inhabitants of the OKV have access to foreign goods, as demonstrated high-lead content glass beads (possibly manufactured in China in the 6th Century CE) (Fuxi, 2009), which were part of the goods associated with infant burials. Stoneware ceramics were also observed to have been part of the extralocal wealth that predated wet-rice production (Acabado, 2017). In Ifugao, we also see a similar pattern where feasting resulted in the consolidation of political and economic resources, which became the backdrop for successful resistance against Spanish conquest (Acabado, 2017).

2. The Ifugao

Ifugao is one of the six provinces located in the Cordillera Administrative Region (CAR) of northern Luzon (Fig. 1), roughly 350 km from the Philippine capital region of Metro Manila. Its neighboring provinces include Benguet to the west, the Mountain Province to the north, Isabella to the east, and Nueva Vizcaya to the south. Ifugao encompasses 251,778 ha of land consisting of heavily forested mountains, rolling hills, plateaus, intermittent valleys, rivers, and extensive rice terraces (Pastor et al., 2005: 1-2; Taguiling, 2013: 470). Irrigated rice terraces dominate the Ifugao landscape, however, maintenance of wet-rice fields are dependent on managed forests and swidden fields (Acabado, 2012a, Acabado and Martin, 2015). The magnificence of the rice terraces has motivated romantic notions of the origins of the agricultural features: Barton (1919) and Beyer (1955) have both suggested that the terraces were constructed at least 2000 years ago. Ethnohistoric (Keesing, 1962) and archaeological studies (Acabado, 2009, 2010, 2015), however, suggest a more recent origin, one that has its roots in the Spanish conquest.

2.1. Ifugao social organization

Ifugao society is organized around a competitive prestige economy that is founded on rice production (Acabado, 2013; Conklin, 1980). They have a bilateral, consanguine kinship system in which individuals trace their lineage through both parents. The Ifugao have a strong bond with their blood kin, but non-kin relations are established based on practical interests. The Ifugao are monogamous, and upon marriage, the bride and groom inherit rice lands, particularly if one or both are

first born (rule of primogeniture). Post-marital households are established in settlements closest to the most productive rice lands inherited by both partners. Customary marriage in Ifugao is a union of families, which increases the social network and source of labor for both sides of the families. Ifugao marriage involves bride wealth in the form of pigs and prestige items (e.g. beads and tradeware ceramics).

Several households make up a village (*buble*) and villages within a valley make up a district (*himpuntonā'an*) (Acabado, 2013; Acabado and Martin, 2015). A district is the largest integrated territorial unit in Ifugao, but a few districts are linked based on shared water sources for wet rice irrigation and/or swidden plots. Within districts, the first land cleared for rice farming is referred to as *puntonā'an*. There are stewards (*tomona'*) that reside within different *puntonā'an*, and they make all the agricultural decisions within a district (Acabado, 2013: 176; Conklin, 1980: 5-6)

To the Ifugao, economic and social prosperity hinge on an individual's ability to sponsor rituals and feasts. Male religious specialists (mumbaki) typically guide ritual activities, but female religious specialists (mama'o) also perform some rituals (Conklin, 1980: 12). Ethnographic studies in Ifugao (Acabado, 2013; Conklin, 1980; Remme, 2015) note that the consumption and distribution of meat during feasts strengthen kin relations and solidifies non-kin relations (Fig. 2). Furthermore, the number of sacrificial animals also signals social standing and wealth. Individuals are able to elevate and maintain their status by transforming their wealth, accumulated through the production of rice, through ritual feast. Thus economic prosperity or adversity can impact one's ability to sponsor ritual feast and social standing (Remme, 2015: 20), which is apparent in Ifugao social ranking.

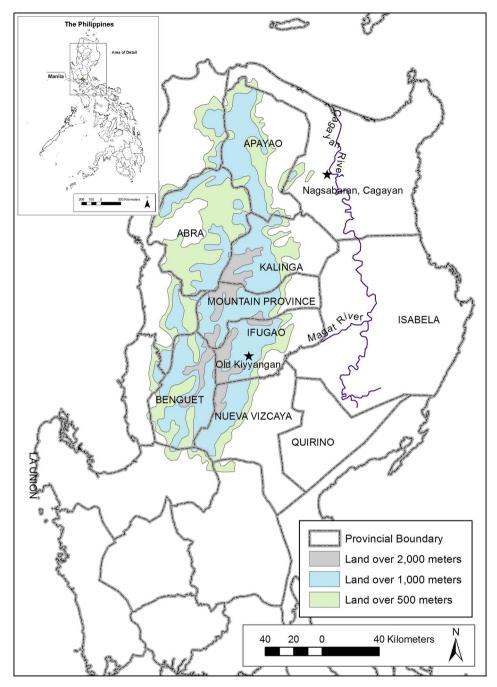
The elite (kadangyan) wield considerable ritual and political influence in Ifugao society. Although the kadangyan hold no political position, their influence stem from their accumulated wealth and prestige (Acabado, 2017). An individual can be born or initiated into this rank, but in both cases, a series of rituals must be performed to establish social ranking (e.g. hagabi, balog, uya'uy, ballitong, lotob). Acabado (2017: 11-12) suggests that access to ritual items like domesticated animals limit social mobility among individuals. While the middle class (tagu) do own rice lands, they cannot afford the expenses associated with status elevation rituals and ceremonies. Moreover, since the poorest class, the nawotot, typically do not own rice lands, their social mobility is very limited (Acabado, 2017; Barton, 1922a: 418). Acabado (2013: 175) further notes that Ifugao social status are evaluated by the number of feasts sponsored that are publicly quantified by the number of pig and carabaos (water buffalo) skulls mounted in an Ifugao house (bale).

Raising domesticated pigs is not restricted culturally, but the cost of raising one is prohibitive, as pigs in Ifugao are fed sweet potato. As mentioned above, non-rice landholders eat sweet potato and/or taro the whole year round, with rice provided by the *kadangyan* as payment for services or during ritual feasts. In this case, a *kadangyan* would have the resources to raise pigs.

As such, the Ifugao indigenous concept of social status is similar to other Philippine groups, which is based on potency or charisma and archaeologically visible through high-status goods or prestige goods (Bacus, 1999; Barretto-Tesoro, 2008; Junker, 1999b). Economically, elite status also means that individuals in this rank would have a higher access to valued foods and foreign goods. They will also be able to control labor, particularly, in the production of wet-rice that requires a stable labor force. As a prestige-based economy, Ifugao social status could be translated to the political arena.

2.2. Wet-rice agriculture in Ifugao

In Ifugao, the adoption of wet-rice agriculture is at the forefront in discussions regarding social ranking vis-à-vis prestige economy (Acabado, 2009, 2012b, 2017). Various scholars (e.g. Acabado, 2009, 2012b, 2017; Dozier, 1966; Keesing, 1962) have suggested that the



 $\textbf{Fig. 1.} \ \ \textbf{The Northern Philippines, with Cordillera and Cagayan Valley Provinces labeled}.$

Spanish conquest of the Magat River Valley urged the Ifugao to strategically resettle in the Philippine Cordillera Mountains between 1600 CE and 1700. Shortly after, the Ifugao adopted wet-rice agriculture and built extensive rice terraces in the Cordillera mountains. Since wet-rice cultivation is labor intensive, Acabado (2017) asserts that this agricultural movement established a ranked society that awarded political power to individuals skilled in mobilizing the community. This competence is displayed in rituals accompanied by the butchering and consumption of domesticated animals. Similar to Hayden's (2014) discussion of the influence of feasts in creating differential social status, Acabado (2017) asserts that ritual feasting in Ifugao created and maintained a prestige economy. Although there was already social ranking before the introduction of wet-rice agriculture, the ranking intensified as soon as the shift occurred. This is similar to what Barton (2012) has documented in the Kelabit Highlands of Borneo, where a

shift to wet-rice intensified feasts and rituals as well as drastically change the sociopolitical organization of the Kelabit.

2.3. Ifugao ritual feasts and prestige

Every Ifugao household performs rituals that are accompanied by animal offerings. Rituals of nearly all kinds are performed under an Ifugao house or a granary. These rituals occur year round supporting various functions including divination, hunting, swidden farming, rice rituals, prestige feasts, sale of slave, debt collection, head-hunting, head-losing, peace, marriage, divorce, difficult birth, and death (Barton, 1919: 201). Barton's (1919: 199) ethnographic study on Ifugao religion note over fifty distinct rituals associated with most if not all features of Ifugao life. Modest items (e.g. rice wine, rice cake, small portions of meat, betel nut and tobacco) to the most elaborate (e.g.

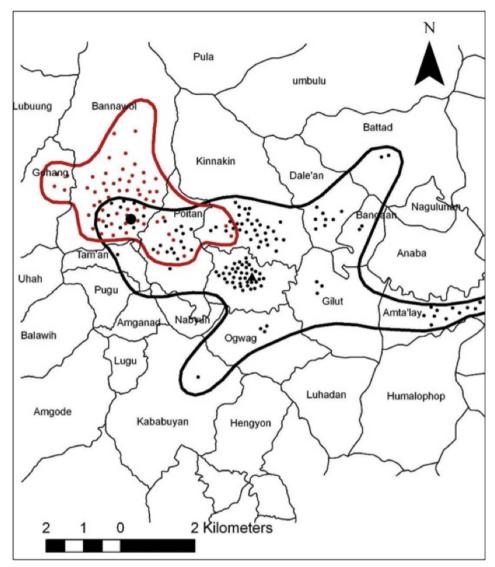


Fig. 2. Extent of relationships between Bayninan residents and other agricultural districts. Conklin (1980: 82–83) obtained this information from a prestige feast (marriage) in 1966. Red polygon shows extent of the bride's effective kindred while the black polygon illustrates the groom's effective kindred. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

chickens, pigs, carabaos) are offered to propitiate various deities, ancestral spirits, and other supernatural beings (Barton, 1919; Conklin, 1980). Ritual offerings are believed to bring a range of benefits including an abundance of crops and domestic animals, good health, success in hunting, physical safety, and protection from misfortunes (Barton, 1919).

Although Ifugao rituals typically require a minimum number of animal sacrifices, additional offerings can be made depending on the sponsor's access to feast-worthy food. During funerals, wealthy families perform two or three animal offerings, while poor households only perform one (Barton, 1919: 178). Funerary offerings typically consist of chickens, pigs, and/or carabaos (Barton, 1919). Ethnographic sources (Barton, 1922a, 1919; Conklin, 1980; Remme, 2015) have identified chicken and pig as the most frequently utilized animals in Ifugao rituals. Conklin's (1980) ethnography of the Bayninan hamlet indicate that within a year, this community offered approximately 467 chickens, 76 pigs, and 4 carabaos. The rarity of a carabao sacrifice likely corresponds directly to its monetary value. Despite the great expenses associated with animal sacrifice, the Ifugao go to great lengths in securing them. Some households sell parcels of their rice land to obtain sacrificial animals (Remme, 2015: 20). This effort is likely linked to the association of animal sacrifice with rank and prestige.

Offerings not only function to appease the supernatural, but also to maintain and/or create interpersonal relations (Barton, 1919: 126; Remme, 2015:37–54). Barton (1919: 126) asserts that Ifugao animal sacrifices are made with the intent to influence corporeal matters:

"In one sense every sacrifice of importance, every sacrifice, let us say, that involves the offering of pigs, is, in some degree, a prestige feasts, for the prominence of an Ifugao in his kinship group depends largely on the extent of his sharing meat with his kinsmen. But there are certain feasts whose predominant purpose is to maintain or secure prestige and rank."

What follows the ritual sacrifice of an animal is its consumption, and in the case of pig sacrifices, the distribution of raw pig meat to kin and non-kin ritual participants (Acabado, 2013: 171–172; Conklin, 1980: 83). The latter entails an elaborate and prescribed system of meat distribution. Particular portions of meat are distributed to specific relatives, and participants also receive meat in return for gifts given to the ritual sponsor (Remme, 2015: 27–53). Through this exchange, ritual animals gain significant value as high status food (Remme, 2015: 98). The type of meat – or animal part – handed out during feasts recreate kin relationships. Failure to give the expected animal part is considered an insult and will result in the weakening of kin relationship.

In Ifugao, social mobility is highly influenced by the expanse of

one's rice fields (Barton, 1922a: 418), and access to domesticated animals (Barton, 1919: 127–138). Barton (1922a: 428) notes that rice is equivalent to money in Ifugao, hence it can be used to purchase ritual commodities such as pig and *carabao*. Conversely, pig and carabao can be utilized to purchase rice fields (Barton, 1922b: 430). Animal sacrifice is also believed to be responsible for increased yields in rice production and multiplication of domesticated animals (Barton, 1919: 110–125; Conklin, 1980: 13–34), thus the intricate year-round rituals associated with the rice cycle. In this way, wealth, prestige, domesticated animals, and rice terraces are mutually dependent.

The ethnohistoric and ethnographic accounts of Ifugao rituals and feasts point to activities that seem to strengthen community bonds and serve as a venue for political consolidation. Ifugao funeral feasts fit the pattern of lavish competitive events typical of tribal feasts elsewhere in Southeast Asia where each family or kin group are trying to outdo others (Hayden, 2016) to acquire allies in interpolity conflicts and/or for pre-eminence in village politics and economic control. Acabado (2017) however, views these feasts as the initial step in the political consolidation that occurred in Ifugao soon after contact with the Spanish. Acabado further regards the shift to wet-rice cultivation and political consolidation as strategic response of the Ifugao to successfully turn back repeated attempts by the Spanish to establish permanent presence in the region. To investigate whether these communitystrengthening activities were practiced in the past - as a response to Spanish conquest - the Ifugao Archaeological Project focused its work on an abandoned village, which was known to have existed during the Spanish colonial times.

3. Old Kiyyangan Village

The Old Kiyyangan Village Site (CAR-2012-W1) (Fig. 3) is located approximately 4 km from the modern town of Kiangan. It is situated in a valley adjacent to the junction of Ibulao and Ambangal rivers

(Acabado, 2015: 54). Tuwali-Ifugao myth and ethnographic accounts suggest that this site was the first settlement inhabited by the Ifugao people in the Cordillera Mountains (Acabado, 2015). Currently, the site lies beneath agricultural pond fields predominantly utilized for wet rice cultivation.

The site was abandoned towards the end of Spanish colonial period (ca. 1870s) (Record Historico, 1911: 2). There are some speculations regarding the circumstances leading to abandonment of the site, but these claims remain unsubstantiated (Maher, 1984). Acabado's (2013, 2015, 2017) investigations at OKV suggest that the site was initially occupied between 1050 CE and 1260, and abandoned by the late 1800s. The radiocarbon chronology for OKV confirms these earlier findings (see Table 1).

The initial settlers of the site cultivated taro and later adopted wetrice agriculture ca. 1600 CE. Settlement expansion and an increase in exotic trade goods coincide with the shift to wet rice from taro cultivation. Historical records also support Acabado's archaeological findings. In 1801, Father Juan Molano notes that OKV had 186 houses, a figure excluding four other neighboring villages with at least ten to forty other households (Newson, 2009: 236). This data suggests a population of over four thousand individuals, a number that rivals contemporary population standards throughout the Philippines (Acabado, 2017).

Robert Maher and his team began excavations in Old Kiyyangan Village in 1978 (Maher, 1984: 119), and the Ifugao Archaeological Project (IAP), led by Stephen Acabado has conducted excavations between 2012 and 2016. The IAP project has sampled 32 units/trenches, ranging from $0.5 \times 0.5 \, \mathrm{m}$ test units to $2 \times 4 \, \mathrm{m}$ trenches. Excavated sediments were screened through one-eight-inch (3.5 mm) mesh screens resulting in the recovery of earthenware ceramics, porcelain, stoneware, glass and stone beads, fetal/neonate human jar burials, neonate/infant human supine burials, isolated human adult remains, and vertebrate fauna.

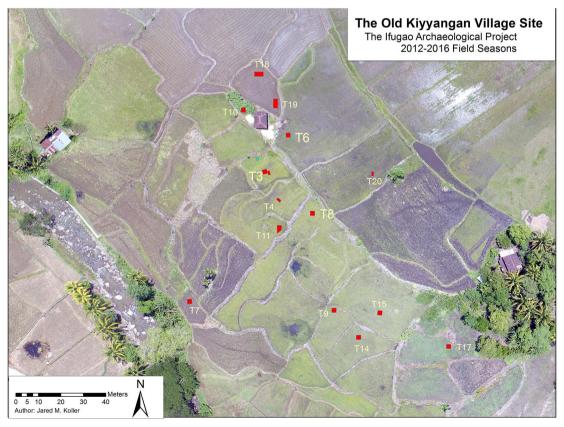


Fig. 3. The Old Kiyyangan Village Site (OKV), Kiangan, Ifugao.

Table 1

AMS dates from Old Kiyyangan Village, using the IntCal09 (organic sediment samples) and IntCal13 (remaining samples) databases (Talma and Vogel, 1993; Heaton et al., 2009; Reimer et al., 2009).

Trench	Depth (cm) Lab number		Material dated	Uncorrected ¹⁴ C age (RYBP)	Adjusted age range (Cal BP, 2σ)	Adjusted age range (Cal CE, 2 σ)
8	100–110	Beta-356305	Organic sediment	720 ± 30	810–750	1220–1280
8	65–70	Beta-356306	Organic sediment	620 ± 30	680-620	1280-1390
8	30-40	Beta-356307	Organic sediment	190 ± 30	260-200	1640-modern
8	80-90	Beta-394182	Human bone collagen	600 ± 30	730–670	1265-1380
8	55-73	Beta-394185	Human bone collagen	410 ± 30	530-470	1405-1445
6	90-100	Beta-421036	Charcoal	660 ± 30	690-630	1280-1390
6	90-100	Beta-421037	Potsherd residue	590 ± 30	610-550	1300-1415
14	50-60	UCIAMS-183276	Chard wood	415 ± 15	510-469	1440-1480
14	60-70	UCIAMS-183272	Chard wood	345 ± 15	477-317	1470-1633
14	80-90	UCIAMS-183273	Chard wood	570 ± 15	634–537	1315-1415
14	90–100	UCIAMS-183274	Chard wood	665 ± 15	669–564	1280–1385

Deposits that are below the plow line are well preserved as only the upper 20 cm are disturbed by agricultural activities, within the limits of hand shoveling. In addition the units sampled were all from the center of the village, based on the existence of infant burials. Ifugao oral history reports that precolonial infant burials are placed under the house of the family, which was supported by the archaeological excavations. In addition, the site was converted to rice fields only before the Second World War according to the landowner.

As previously mentioned, scholars (e.g. Acabado, 2009, 2012a, b, 2017; Dozier, 1966; Keesing, 1962) have argued that population expansion in Ifugao was linked with the conquest and colonization of lowland Luzon. Archaeological data from OKV supports this hypothesis. The appearance of wet-rice cultivation, settlement expansion, increase in exotic goods (e.g. porcelain, stoneware, stone and glass beads), and an upsurge in the consumption of domesticated animals (e.g. carabao and pig) for ritual purposes increased during the Spanish colonial period in the Philippines (Acabado, 2017: 16).

Ledesma et al.'s (2015) initial analysis of faunal remains from the lower levels of OKV shows that Philippine deer (*Rusa marianna*) comprise 70% of the faunal remains; only 25% of the recovered fauna remains were identified as belonging to pigs (wild and domesticated varieties). This distribution was reversed soon after Spanish contact, as this paper reports.

3.1. Trenches sampled

Given this study's focus on fauna and ritual feasts, materials discussed here are derived from three Trenches (8, 9, and 14) with the greatest density of faunal remains and/or human burials. A minimum number of 4 human burials (1 neonate burial, 2 comingled infant burials, and 1 isolated adult element) were recovered from Trench 8. Trench 9 yielded 4 neonate/infant burials, 3 neonate jar burials, and 7 isolated adult elements. A perinate jar burial and three isolated adult elements were recovered from Trench 14. These three units contained vertebrate faunal specimens (e.g. pig, deer, carabao, chicken, fish, lizards) with an NISP of 2742 weighing approximately 4580 g. The faunal remains were identified using comparative collections acquired and prepared during the 2015 and 2016 field seasons, published reference materials (Adams and Crabtree, 2009; Hillson, 2009), and the Cotsen Institute of Archaeology's Sus scrofa comparative osteological collections at UCLA.

Our sampling method was influenced by ethnographic accounts linking modern funerary rituals and feasting. Adult burials involve a drawn out sequence of rites that may last between three to seven days before entombment occurs. The wealthier the family, the longer the funerary rituals last (Barton, 1919: 178). Bogwa, a secondary burial practice extends the funerary ritual to five years (Barton, 1919: 193–194). After the flesh has decomposed, the bones are unearthed, cleaned, and placed under an Ifugao house. A ritual feast ensues either

immediately, or when the deceased's family can finally afford the necessary animal sacrifices. Feasts associated with this extensive ritual include chickens, pigs and/or carabaos. While adult burials are treated lavishly, funerary rites for children ages of twelve and below are comparatively modest (Barton, 1919: 193):

"A victim is always offered for the soul – it may be only a small pig – and given in charge to the ancestors to care for in the region of the souls until the child be large enough to take charge of it himself. The body is laid in a sort of cradle... buried in a grave near the house, wrapped in a blanket and laid on a board. Around Kiangan babies are sometimes buried in a clay pot."

Additionally, difficult pregnancy/birthing are also remedied with a ritual involving chicken, pig and/or carabao sacrifices. There are many points in which the ethnographic record is reflected in the archaeological assemblage from OKV.

Human remains from OKV consist primarily of isolated adult bones, articulated children ages two and below, and fetal remains in earthenware jar burials (Lauer and Acabado, 2015). A variety of wild and domesticated faunal remains were present in the surrounding soil matrix. The most convincing link between contemporary and former burial practices at OKV is the jar burials. Coincidently, pigs are abundant, but chickens and carabaos are rare at OKV. Another link between past and present Ifugao funerary practice are the isolated adult bones from OKV. These isolated finds may represent skeletal elements dropped during secondary burial rituals. Acabado (2017) has argued elsewhere that the abundance of pig remains in OKV is related to ritual feast during the Spanish period colonial period. This paper hypothesizes that the pig remains from OKV consists of wild and domesticated suids. We also argue that the increase in the consumption of pigs is linked to feasts associated with various rituals including funerals.

4. Pig species in Ifugao

While recently introduced commercial pigs are widely used in the Philippines, wild pig (*Sus philippensis*) and "native" pig (Philippine *Sus scrofa*) are still routinely exploited in Ifugao for both mundane consumption and ritual feasts (Remme, 2015). Ifugao rituals forbid the use of wild fauna in a ritual so as not to offend supernatural beings for sacrificing animals that they already own (Remme, 2015: 45–46). Domestically raised pigs are preferred because they imbue the nature of human lifeways, and retain an essence of their owner (see Kolb, 1999: 91 for discussion).

4.1. Wild vs. domesticated pigs

Since wild and domesticated pig species are notoriously difficult to discriminate in zooarchaeological samples, various methods have been developed to aid their identification (see Rowley-Conwy et al., 2012 for discussion). Morphometric analysis of pigs' teeth began in the mid-19th

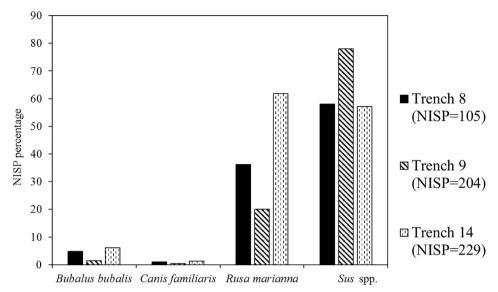


Fig. 4. Large/medium sized mammals identified to genus and species.

century with the use of molar measurements (Rowley-Conwy et al., 2012: 2–3). By the latter half of the 20th century, post-cranial elements such as the astagalus, humerus, and scapula, supplemented dental identification (Rowley-Conwy et al., 2012: 6). Although stable isotope and ancient DNA analysis have recently proven more accurate (see Rowley-Conwy et al., 2012 for discussion), the use of inexpensive low technology morphometric measurements remains the accepted standard (e.g. Albarella et al., 2006; Ervynck et al., 2002; Evin et al., 2015; Peters et al., 2000, 2005). This paper utilizes molar dimensions to discriminate wild and domesticated pig taxa from OKV.

Sus philippensis' body size is comparatively smaller than Sus scrofa, and this difference is reflected in the dimensions of the molars (Piper et al., 2009b: 1). While measurements from a wider variety of postcranial skeletal elements improve the accuracy of identification of the entire vertebrate archaeofauna (see Rowley-Conwy et al., 2012 for discussion), we focus on dental measurements because other skeletal elements from OKV were highly fragmented. Few intact pig post-cranial skeletal elements (e.g. astragalus and distal humerus) were recovered. A greater frequency of intact pig teeth was recovered, most likely due to the greater durability of their enamel crowns, leading us to focus our analysis on pig teeth. Other constraints such as the lack of published data on post cranial elements of S. philippensis versus Philippine S. scrofa also influenced our sampling focus. While some studies have noted that pig bones can continue to increase in size a bit even after fusion (see Albarella et al., 2006: 14 for discussion) less variability in tooth size and shape is observed because growth stops after eruption and wear begins. The length of the first and second molars can be affected by age, but width measurements remain consistent. The third molar is the most consistent in size and shape, but since it erupts later in life, age at the time of death can significantly influence its occurrence in archaeological assemblages (see Albarella et al., 2006 and Rowley-Conwy et al., 2012 for discussion). Based on these considerations, the data in this study includes measurements from lower and upper first, second, and third molars hereafter expressed as M¹, M², and M³ respectively.

The dental measurements in this study are based on the standards set by Payne and Bull (1988) and recommended by Albarella et al. (2006). The dimensions utilized here include molar length (M¹L, M²L, M³L), anterior width (M¹WA, M²WA, M³WA), posterior width (M¹WP, M²WP, M³WP), and central width of M³ (M³WC). These measurements were compared with identified modern and archaeological *S. philippenensis* and *S. scrofa* from the Philippines (Piper et al., 2009b) to determine the morphometric affinity of the zooarchaeological samples from OKV. To visualize the variability in these samples, scatter plots are

provided. The variability within the samples is calculated using Pearson's coefficient of variation (V) (Payne and Bull, 1988: 29).

V = Standard Deviation/Mean*100

As discussed by Rowley-Conwy et al. (2012: 17–23), high V value can be interpreted as evidence of two or more populations/species, whereas a low V can be inferred as evidence of a single population/species. However, caution has to be exercised when sample size is extremely low (Albarella et al., 2006).

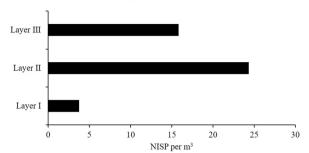
5. Results

The OKV vertebrate archaeofauna identified in this study includes 12 taxa (i.e. 4 species, 2 genera, 1 family, 1 order, 3 classes, and 1 superclass) with an NISP 2306. The identified specimens include water buffalo or carabao (Bubalus bubalis), dog, (Canis familiaris), Philippine brown deer (Rusa marianna), pig (Sus scrofa and S. philippensis.), Artiodactyla, Muridae, unidentified small to medium sized mammals, monitor lizard (Varanus spp.), chicken (Gallus gallus), unidentified birds, and ray-finned fish (actinopterygii). Overall, medium/large mammals are the most abundant, representing approximately 96% of the identified assemblage. Most of the bone specimens in this class are highly fragmented. Only a small sample (4%) was identified to the genus and/or species level including carabao (water buffalo), dog, Philippine deer, and pig. A high frequency of these identified specimens exhibit heat treatment and butchery marks, suggesting that they were a source of meat consumed in OKV.

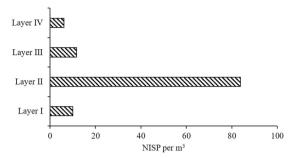
A comparison of carabao, dog, Philippine brown deer, and pig NISP reveal that the latter two taxa were the most abundant (Fig. 4). Barton (1922a: 415–416, 425–430) notes that although carabaos are occasionally consumed in rituals, they are costly for ordinary subsistence. Similarly, dogs are only occasionally consumed (Remme, 2015: 17), and it is one of the least preferred meat sources in Ifugao (Barton, 1922a: 416). According to Barton (1922a: 416), wild pig, deer, and domesticated pig are the most favored meat among the Ifugao. Currently, however, *S. philippensis* (Oliver and Heaney, 2008) and *R. marianna* (MacKinnon et al., 2015) are at risk of global extinction. This assessment is contrary to abundance of deer in OKV, illustrating the rapid decline in the population of this taxa.

The Ifugao customarily consume both wild and "native" pigs (Barton, 1922b: 391, 421; Remme, 2015: 45–46). The identified vertebrate faunal remains from OKV clearly illustrate that the early Ifugao relied heavily on pigs. Moreover, it appears that the consumption of pigs increased through time in OKV. In both Trench 8 and 9,

Density of Sus spp. from Trench 8 by NISP



Density of Sus spp. from Trench 9 by NISP



Density of Sus spp. from Trench 14 by NISP

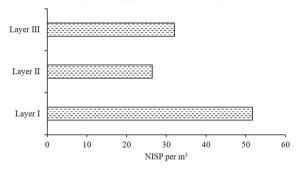


Fig. 5. Density of pig remains in OKV.

Layer II contains the greatest number pig remains. The lower number of pig remains in Layer I is likely due to the deposit's recent disturbance due to modern agricultural practices (Fig. 5). In Trench 14, pigs are most abundant in Layer I, and while this layer also includes some modern agricultural fill, there is considerable disturbance in this location, with the vertebrate faunal remains from Layer II likely mixed in with Layer I (Fig. 5).

Wild pigs are utilized for subsistence and native pigs for rituals (Barton, 1922b: 392; Remme, 2015: 45–46), and although native pigs can be consumed as ordinary food, wild pigs are inappropriate for rituals in Ifugao (Remme, 2015: 45–46). These taxa are difficult to discern based solely on comparative collections, but there is evidence that wild and domesticated pigs are present at OKV when compared with modern and archaeological samples compiled by Piper et al. (2009b) (Figs. 6 and 7). Although the sample size (see Table 3) from OKV and Piper et al.'s study are limited, the comparison herein shows promising results.

Piper et al. (2009b) identified the Nagbasaran suid molars based on measurements of modern collections of *S. philippensis* (included in the scatterplot in Figs. 5 and 6), and measurements of *S. scrofa* from Malaysia and Sumatra as cited by Medway (1978). The latter measurements are not included in this study since these figures represent only ranges of *S. scrofa* molar size. When combined with the suids identified by Piper et al. (2009b) (i.e. Philippine *S. scrofa* and *S. philippensis*), and the modern museum *S. philippensis*, the OKV pigs emerge as two distinct populations, representing two distinct pig species.

5.1. Scatter plots of lower molars and upper molars

The pig teeth from OKV are highly fragmented, and only 26 M were intact for measurements (see Table 2). Measurements from lower M^1 and M^2 illustrate clustering indicative of the presence of *S. philippensis* and Philippine *S. scrofa* in OKV. OKV pigs cluster with both Nagbasaran *S. scrofa* and modern *S. philippensis*. Note that some *S. scrofa* from Nagbasaran also cluster with modern *S. philippensis*. Measurements from M^3 are less useful due to sample size. Based on upper M^1 anterior and

posterior widths, there are also two distinct OKV pig populations, one that cluster with Nagbasaran and modern *S. philippensis*, and another with Nagbasaran *S. scrofa* (see Figs. 6 and 7).

These molar measurements alone do not confirm whether or not the increase in pig consumption in OKV is the result of an upsurge in hunting or intensification of rituals due to population movement. Moreover, the molars sampled from OKV are too few to make projections of population size of wild and/or native pigs from OKV. We can only cautiously infer the presence of two populations of pigs. On the other hand, we are confident that dramatic increase in pig demand during the Spanish colonial period suggests rapid population increase. Elsewhere, Acabado (2017: 16) has shown the increase in prestige animals (pigs and carabaos) during this period.

Barton (1922b: 55; 1919: 169–193) notes that when children fall ill, pigs (and other domesticated animals) are sacrificed to restore health, and when they perish, pigs are also butchered. These practices are also performed for adults, but in OKV, fetal and infant remains dominate, especially in Trenches 8, 9, and 14. The few adult human skeletal isolates are expected since the Ifugao practice exhumation. The deceased are routinely disinterred from their resting place, their tombs and bones cleaned, rewrapped in death blankets and returned to the grave. The isolates from OKV may represent bones dropped during similar instances. The adult human remains that we recovered had a cut mark that could have come from post-mortem processing (Lauer and Acabado, 2015: 34).

Adult burials are located outside the village, which can be at least half a kilometer away. Adult bone bundles are kept in crypts adjacent to the houses of the relatives of the deceased. The cleaning of the bones, performed after one year since death, and when relatives feel the need to ask the spirits of dead ancestors for help (i.e. family crises, illness, bad harvest, etc.). Lavish feasts characterize the practice of secondary burial, as such, Ifugao mortuary practices are also venues for competitive feasting.

After a series of funerary rites, pig(s) are slaughtered as offerings, the meat cooked and consumed at the site of ritual, and meat distributed to ritual participants for their personal use (personal

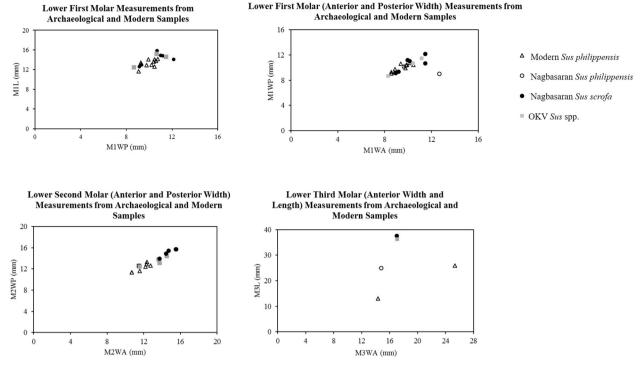


Fig. 6. Modern S. philippensis, OKV and Nagbasaran pig lower molar measurements.

observation; Remme, 2015: 123–124). We make a case that the pig remains from the trenches sampled are sacrificial offerings associated with the burial, particularly, infant burials. Since domesticated animals are a requirement in Ifugao rituals, it is reasonable to infer that the greater frequency of native pigs rather than wild pigs at OKV is due to the frequency of human burials in the excavated trenches.

5.2. Size variation in OKV and Nagbasaran pigs, and modern S. philippensis

While the scatterplots discussed herein are compelling, it is clear that a larger sample size is necessary for greater accuracy. As previously mentioned, a narrow V infers one population, while a large V is indicative of two or more populations; a V value less than 7 is typically

considered narrow (see Albarella et al., 2006 and Rowley-Conwy et al., 2012 for discussion). As discussed by Albarella et al. (2006:108), a small sample size can significantly affect calculations of the coefficient of variation.

In Table 3, the effect of a sample size is illustrated within the modern *S. philippensis* samples. Although these specimens are confirmed as *S. philippensis*, they exhibit V greater than 9, especially in molar measurements where n is less than 11. This wide V is generally a result of a small sample size since the majority of the modern *S. philippensis* molar measurements are relatively clustered (see Figs. 6 and 7).

Similarly, the OKV and Nagbasaran V are diffused (i.e. greater than 8) in most molar measurements. While this analysis does not dispute Piper et al.'s (2009b) identification, it does call attention to the need for

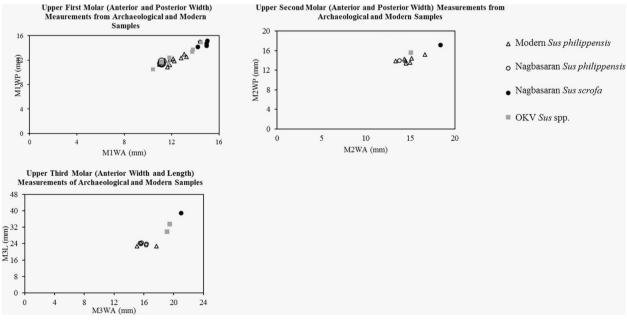


Fig. 7. Modern S. philippensis, OKV, and Nagbasaran pig upper molar measurement.

Table 2
Sus sp. molar measurements (mm) from Old Kiyyangan Village.

Trench	Depth (cmbd)	Position	Element	Side	M1L	M1WA	M1WP	M2L	M2WA	M2WP	M3L	M3WA	M3WC	M3WP
8	20-30	Lower	M1	L	15.17	10.44	10.67							
8	20-30	Upper	M3	R							*	17.66	*	*
8	20-30	Upper	M1	R	11.66	10.42	10.5							
8	30-40	Upper	M1	R	12.19	11.08	11.6							
8	40-50	Upper	M3	R							33.45	19.47	17.86	12.49
8	50-60	Upper	M1	R	14.87	13.79	13.71							
8	50-60	Upper	M1	R	14.26	13.73	13.38							
8	59	Upper	M3	L							29.88	19.13	17.33	10.9
8	80-90	Upper	M2	R				20.2	15.05	15.56				
8	80-90	Lower	M2	L				16.4	11.58	12.4				
9	20-30	Lower	M3	L							36.32	17.09	16.09	12.31
9	20-30	Lower	M1	R	*	10.82	*							
9	20-30	Lower	M2	R				*	17.85	*				
9	30-40	Upper	M2	R				14.82	*	*				
9	30-40	Upper	M1	R	12.37	11.19	11.65							
9	53-60	Upper	M1	R	13.07	11.8	12.41							
9	70-80	Lower	M2	L				16.81	13.72	13.14				
9	80-90	Upper	M1	R	15.40	14.46	14.9							
9	106	Upper	M1	R	15.17	11.74	11.51							
14	20-30	Lower	M1	R	12.47	8.31	8.66							
14	20-30	Lower	M1	R	14.60	11.18	11.48							
14	50-60	Lower	M2	R				14.27	13.62	13.83				
14	60–70	Lower	M3	L							*	13.19	*	*
14	90–100	Lower	M1, M2, M3	L	14.81	*	*	18.48	14.51	14.4	*	16.89	16.02	12.65

^{*} No measurement due to fragmentation.

study of greater number of reference specimens to confirm identification. Since the population of *Sus philippensis* is at risk of global extinction (Oliver and Heaney, 2008), there is very limited comparative collection available. As for native pigs (*S. scrofa*) from the Philippines, museum collections are limited. This study represents a starting point for future studies of Ifugao vertebrate faunal remains. A substantial

opportunity to gather morphometric data on native pigs raised in Ifugao and used in various feasting rituals exists since their skull are often reserved for display after ritual ceremonies.

Table 3

Number (n), mean, standard deviation (SD) and Pearson's coefficient of variation (V) for measurements of modern *Sus philippensis* and Archaeological *Sus* spp. from Nagbasaran and OKV sites. Note: Identified *S. philippensis* and *S. scrofa* from Nagbasaran are combined.

Lower	M1L	M1WA	M1WP	M2L	M2WA	M2WP	M3L	M3WA	M3WC	M3WP
Modern Sus philippensis										
n	11	11	11	8	8	8	2	4	3	2
Mean	13.31	9.47	10.02	16.25	11.76	12.27	25.67	13.42	12.28	9.03
SD	1.43	0.87	0.80	1.63	1.27	1.11	5.08	1.70	1.90	1.78
V	10.76	9.17	7.99	10.02	10.84	9.01	19.81	12.65	15.49	19.75
Nagbasaran										
n	9	8	6	5	5	5	2	3	3	2
Mean	13.92	10.36	10.58	19.31	14.79	15.13	31.22	16.51	16.07	11.66
SD	1.21	1.37	1.15	2.99	0.77	0.75	8.96	1.51	3.07	3.69
V	8.69	13.18	10.87	15.46	5.18	4.99	28.70	9.17	19.11	31.66
OKV										
n	4	4	3	2	3	4	1	3	2	2
Mean	12.210	8.950	8.453	11.583	12.245	10.743	N/A	12.543	11.370	8.987
SD	1.218	1.288	1.452	1.732	2.282	0.865	N/A	2.196	0.049	0.240
V	9.98	14.39	17.18	14.95	18.64	8.05	N/A	17.51	0.44	2.68
Upper	M1L	M1WA	M1WP	M2L	M2WA	M2WP	M3L	M3WA	M3WC	M3WP
Modern Sus philippensis										
n	11	11	11	7	7	7	2	3	2	1
Mean	12.88	12.02	11.89	16.11	14.86	14.12	22.79	15.78	13.39	6.87
SD	0.92	0.75	0.64	3.12	2.62	2.43	10.39	5.84	5.73	3.39
V	7.16	6.24	5.37	19.38	17.65	17.21	45.61	36.97	42.82	49.33
Nagbasaran										
n	8	9	9	2	2	2	7	7	7	7
Mean	14.47	13.11	13.28	18.94	16.09	15.55	28.26	16.62	15.20	9.81
SD	1.27	1.90	1.67	3.34	3.29	2.26	7.29	1.97	2.42	3.18
V	8.77	14.49	12.58	17.62	20.44	14.55	25.81	11.82	15.95	32.40
OKV										
n	8	8	8	2	1	1	2	3	2	2
Mean	13.62	12.28	12.46	17.51	15.05	15.56	31.67	18.75	17.60	11.70
SD	1.48	1.50	1.44	3.80	N/A	N/A	2.52	0.96	0.37	1.12
V	10.85	12.22	11.56	21.73	N/A	N/A	7.97	5.13	2.13	9.61

6. Discussion

The investigation reported here provided support to the assertion that intensification of rituals among the Ifugao played a major role in their successful resistance against Spanish conquest. As observed in other traditional societies, various domesticated bovids, caprids, and suids are utilized exclusively for feasts and rituals (Conklin, 1980: 177–118; Jordan, 2003: 125, 147, 278; Marshall and Hildebrand, 2002: 104). This ritual demand for domesticated animals have been proposed as one of the catalyst for the development of sophisticated agricultural practices worldwide (see Hayden, 2014 for discussion).

In the Ifugao province of the Cordillera Administrative Region (CAR) of the Philippines, the adoption of wet-rice agriculture has been brought to the forefront in discussions regarding social stratification vis-à-vis prestige economy (Acabado 2009, 2012a, b, 2016). Various scholars (e.g. Acabado, 2009, 2012a, b, 2016; Dozier, 1966; Keesing, 1962;) have suggested that the Spanish conquest of the Magat River Valley urged the Ifugao to move to the Cordillera Mountains in the 17th century. Shortly after, the Ifugao adopted wet-rice agriculture and built extensive rice terraces.

Since wet-rice cultivation is labor intensive, Acabado (2017) asserts that this agricultural movement established a ranked society that awarded political power to individuals skilled in mobilizing the community. This competence is displayed in rituals accompanied with the butchering and consumption of domesticated animals. Similar to Hayden's (2014) discussion of the influence of feasts in creating differential social status, Acabado asserts that ritual feasting in Ifugao created and maintained a prestige economy. Our analysis of the pig remains in OKV suggests that there was an increase in pig consumption due to ritual intensification.

Although the increase in the density of pig remains from OKV can alternatively be the result of the overall increase in human population, we argue that it is linked to Ifugao ritual feasts. Scholars (e.g. Blaton and Taylor, 1995; Falvey, 1977; Feil, 1987; Modjeska, 1982) assert that agricultural intensification in some traditional societies emerged not as a way to produce agricultural surplus for everyday consumption, but as a means for producing and financing ritual specific products such as meat and alcohol. Ethnographic accounts illustrate the importance of ritual feast in Ifugao society. From marriages to funerals, domesticated animals are a requirement to the Ifugao (Barton, 1922b; Remme, 2015). Our study suggests that Ifugao ritual feasts initially intensified during the Ifugao's resistance against Spanish colonialism.

7. Conclusion

In this paper, we argue that domesticated pigs were entangled in the maintenance of a ranked social order that emerged from the Ifugao's resistance against Spanish colonialism. Our analysis of the vertebrate archaeofauna recovered from Old Kiyyangan Village demonstrates that the demand for pigs increased through time. Utilizing traditional morphometric data measurements of selective pig teeth from OKV, modern *Sus philippensis*, and archaeological samples from the Nagbasaran site (Piper et al., 2009b), we infer that the pig remains from OKV include of two pig species, *Sus philippensis* and *Sus scrofa*. We argue that the increase in pig remains through time at OKV represents an increase in pig farming and demand for ritual feasting. The presence of neonatal and infant burials in the units excavated suggests the occurrence of funerary rituals resembling Ifugao's contemporary mortuary practices (Remme, 2015).

Due to species specific and geographic variability, morphometric identification of wild and domesticated suids benefits from a large sample size of archaeological specimens and regional specific reference materials (Albarella et al., 2006; Rowley-Conwy et al., 2012). Advanced statistical method (e.g. Evin et al., 2015), requiring a large sample sizes, have also aided in reducing errors in identification. While many studies in Europe, Middle East, and East Asia benefit from numerous published

data on pig domestication and morphometrics, zooarchaeological study represents relatively new and developing thrust of Philippine archaeological practice. While the sample size from OVK used in this study is limited, the sample represents one of the only two studies (see Piper et al., 2009a, b) conducted in the Philippines that have utilized morphometric data from pig teeth. This investigation helps to pioneer zooarchaeological studies addressing social developments in the Philippines that can ultimately contribute to the wider global interest in vertebrate subsistence and exploitation practices as they relate to emergent sociopolitical complexity. Moreover, this work also provides support to the contention that animals were domesticated for feasting purposes.

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